

REMARKS

Claims 35 and 44 are amended. Claims 35-45 are pending in the application.

Claim 36 stands rejected under 35 U.S.C. §112 first paragraph as failing to comply with the written description requirement. The Examiner indicates that claim 36 contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor had possession of the claimed invention at the time the application was filed. The Examiner further states that the use of plasma in the atomic layer deposition reaction chamber during the incorporation of at least portions of the molecule into the material to align non-ionized molecules is new matter. However, claim 36 does not recite use of a plasma to align molecules. The Examiner is directed to the language of claims 1 and 2 as originally filed. The language of claim 2 matches the language of present claim 36. Accordingly, claim 36 does not add “new matter” to the application. Accordingly, applicant requests withdrawal of §112 rejection of claim 36 in the Examiner’s next action.

Claims 35, 37-40 and 42-43 stand rejected under 35 U.S.C. §102(e) as being anticipated by Chiang, U.S. Patent No. 6,630,201. The Examiner is reminded by direction to MPEP §2131 that anticipation requires each and every element of the claim to be disclosed in a single prior art reference. Claims 35, 37-40 and 42-43 are allowable over Chiang for at least the reason that the reference fails to disclose each and every element in any of those claims.

Referring to independent claim 35 such recites utilization of one or both of an electric field gradient and a magnetic field gradient to align non-ionized and electrically neutral molecules during atomic layer deposition. Claim 35 is amended to clarify that it is at least portions of the non-ionized and electrically neutral molecules which are

incorporated into a material formed over a semiconductor substrate during the atomic layer deposition. The Examiner indicates reliance upon column 27, lines 6-49 and column 31, lines 42-62 and 24-33 of Chiang as disclosing aligning non-ionized and electrically neutral molecules during atomic deposition. The Examiner is mistaken. Nowhere in column 27 does Chiang disclose alignment of any molecules whatsoever. Referring to column 31, such discloses formation of a precursor with a net charge (either positive or negative) and utilization of an opposite polarity low DC bias of the lowest possible bias that generates a moment on the charge precursor molecule to correctly orient the charge precursor molecule within minimal charging of the substrates (column 31, lines 20-30). Such does not teach the recited orientation of non-ionized and electrically neutral molecules or alignment of said non-ionized and electrically neutral molecules during atomic deposition.

The Examiner indicates that “a new configuration for the electric field gradient is inherent since the change in the deposition parameters for the new material will require a different condition.” However Chiang specifically indicates utilizing a minimum bias for correctly orienting a charged precursor molecule. Accordingly, such teaches a way from utilizing conditions for orienting a non-ionized and electrically neutral molecule. Independent 35 is therefore not anticipated by Chiang and is allowable over this reference.

Dependent claims 37-40 and 42-43 are not anticipated by Chiang for at least the reason that they depend from non anticipated base claim 35.

Claims 41 and 44-45 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Chiang in view of Norman, U.S. Patent No. 6,869,876. The Examiner is reminded by direction to MPEP § 2143 that a proper obviousness rejection has the following three requirements: 1) there must be some suggestion or motivation to modify or combine reference teachings; 2) there must be a reasonable expectation of success; and 3) the

combined references must teach or suggest all of the claim limitations. Claims 41 and 44-45 are allowable over the combination of Chiang and Norman for at least the reason that the references, individually or as combined fail to disclose or suggest each and every element in any of those claims, fail to provide motivation for modification and fail to provide a reasonable expectation of success.

As indicated above, claim 35 recites aligning non-ionized and electrically neutral molecules during atomic layer deposition and incorporating at least portions of the non-ionized and electrically neutral molecules into a material formed over a semiconductor substrate. As amended, independent claim 44 recites at least one of a first molecule and second molecule being non-ionic and electrically neutral during incorporation into a material. As discussed above with respect to independent claim 35, Chiang does not teach utilization of aligned non-ionized and electrically neutral molecules. Further, Chiang specifically indicates methodology as developed for and utilizes ionized species for alignment and aligned deposition. Accordingly, the specific teaching of Chiang for utilization of ionized species for alignment does not provide motivation for modification or provide a reasonable expectation of success for alignment of non-ionized and electrically neutral molecules as recited in each of independent claims 35 and 44.

The Examiner indicates reliance upon the Norman reference for teaching use of ammonia as a precursor. However, as combined with Chiang the Norman teaching of ammonia does not contribute toward suggesting that the claim 35 and 44 recited alignment of non-ionized and electrically neutral molecules during atomic layer deposition. Nor does Norman provide motivation for combination or contribute toward providing a reasonable expectation of success. Therefore, a *prima facie* case of obviousness has not been established regarding claims 35 and 44. Accordingly, claims 35 and 44 are allowable over

the art of record.

Dependent claims 41 and 45 are allowable over Chiang, individually or in combination with Norman for at least the reason that they depend from corresponding allowable base claims 35 and 44.

For the reasons discussed above, pending claims 35-45 are allowable. Accordingly, applicant respectfully requests formal allowance of such claims in the Examiner's next action.

Respectfully submitted,

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